CLAIMS:

1. A method of making a pneumatic tire,

said pneumatic tire comprising

a tread portion,

a pair of sidewall portions,

a pair of bead portions,

a carcass extending between the bead portions, and

a belt disposed radially outside the carcass in the tread portion, said belt composed of a breaker and a band disposed on the radially outside of the breaker,

said method comprising

applying a raw breaker material to a cylindrical drum,

spirally winding a plurality of parallel band cords around the raw breaker material on the cylindrical drum so that angles of the windings are not more than 5 degrees with respect to the tire equator, and

gradually increasing (1) an average density of the band cords in the tire axial direction and (2) an average tension of the band cords in the tire axial direction from a center portion of the band towards each axial edge of the band during winding the band cords.

2. A method of making a pneumatic tire,

said pneumatic tire comprising

a tread portion,

a pair of sidewall portions,

a pair of bead portions,

a carcass extending between the bead portions, and

a belt disposed radially outside the carcass in the tread portion, said belt composed of a breaker and a band disposed on the radially outside of the breaker,

said method comprising

applying a raw breaker material to a cylindrical drum, and

spirally winding a plurality of parallel band cords around the raw breaker material on the cylindrical drum so that angles of the windings are not more than 5 degrees with respect to the tire equator,

increasing an average tension of the band cords in the tire axial direction during winding the band cords from the tire equator towards each axial edge of the band while satisfying the following condition

$$Tn = Kt \times Tc \times (Rc/Rn)$$

wherein

Tn is the average tension during winding the band cords at any position Pn at a certain distance from the tire equator,

Tc is the average tension during winding the band cords at a position Pc at the tire equator,

Rn is the radius of the inner surface of the band in the finished tire at the position Pn,

Rc is the radius of the inner surface of the band in the finished tire at the position Pc, and

Kt is a constant more than 1 but not more than 3, and

increasing an average density of the band cords in the tire axial direction during winding the band cords from the tire equator towards each axial edge of the band to satisfy the following relationships while satisfying the following condition

$$Dn = Kd \times Dc \times (Rc/Rn)$$

wherein

Dn is the average density during winding the band cords at any position Pn at a certain distance from the tire equator,

Dc is the average density during winding the band cords at a position Pc at the tire equator, and

Kd is a constant more than 1 but not more than 3.

3. A method according to claim 2, wherein

said constant Kt is more than 2 but not more than 3, and

said constant Kd is more than 2 but not more than 3.

4. A method of making a pneumatic tire,

said pneumatic tire comprising

a tread portion,

a pair of sidewall portions,

a pair of bead portions,

a carcass extending between the bead portions, and

a belt disposed radially outside the carcass in the tread portion, said belt composed of a breaker and a band disposed on the radially outside of the breaker,

said method comprising

applying a raw breaker material to a cylindrical drum, and

spirally winding a plurality of parallel band cords around the raw breaker material on the cylindrical drum so that angles of the windings are not more than 5 degrees with respect to the tire equator,

increasing an average tension of the band cords in the tire axial direction during winding the band cords from the tire equator towards each axial edge of the band while satisfying the following condition

$$Te = Kt \times Tc \times (Rc/Re)$$

wherein

Tc and Te are the average tensions at the tire equator and the band edges, respectively,

Rc and Re are the radii of the inner surface of the band at the tire equator and the band edges, respectively, and

Kt is a constant more than 1 but not more than 3, and

increasing an average density of the band cords in the tire axial direction during winding the band cords from the tire equator towards each axial edge of the band to satisfy

the following relationships while satisfying the following condition

$$De = Dt \times Dc \times (Rc/Re)$$

wherein

Dc and De are the average densities at the tire equator and the band edges, respectively,

Rc and Re are the radii of the inner surface of the band at the tire equator and the band edges, respectively, and

Kd is a constant more than 1 but not more than 3.

5. A method according to claim 4, wherein

said constant Kt is more than 2 but not more than 3, and

said constant Kd is more than 2 but not more than 3.

6. A method of making a pneumatic tire, said pneumatic tire comprising

a tread portion,

a pair of sidewall portions,

a pair of bead portions,

a carcass extending between the bead portions, and

a belt disposed radially outside the carcass in the tread portion, said belt composed of a breaker and a band disposed on the radially outside of the breaker,

said method comprising:

making a tire main body from raw materials including inner liner rubber, sidewall rubber, bead rubber and a carcass ply, using a tire building drum;

making a tread ring from raw materials including a breaker, band and tread rubber, using a cylindrical drum;

assembling the tire main body and the tread ring into a raw tire; and

vulcanizing the raw tire in a mold so that the breaker has a convex profile such that the radius of the breaker gradually decreases from the tire equator to the axially outer edges of the breaker, and in the meridian section of the tire, the ratio (rs/rc) of the radius (rc) of curvature at the tire equator and the radius (rs) of curvature at the axially outer edges of the breaker is in a range of from 0.99 to 0.96,

wherein

the making of the tread ring includes

applying a raw material for the breaker around the cylindrical drum, and

spirally winding a plurality of parallel band cords around the raw breaker material on the cylindrical drum so that angles of the windings are not more than 5 degrees with respect to the tire equator, and

one of the following steps (1) and (2):

(1) increasing an average tension of the band cords in the tire axial direction, during winding the band cords, from

the tire equator towards each axial edge of the band to satisfy the following relationship

$$Tc \times (Rc/Re) < Te = < 3.0 \times Tc \times (Rc/Re)$$

wherein

Tc and Te are the average tensions at the tire equator and the band edges, respectively,

Rc and Re are the radii of the inner surface of the band at the tire equator and the band edges, respectively;

(2) increasing an average density of the band cords in the tire axial direction during winding the band cords from the tire equator towards each axial edge of the band to satisfy the following relationship

$$Dc \times (Rc/Re) < De = < 3.0 \times Dc \times (Rc/Re)$$

wherein

Dc and De are the average densities at the tire equator and the band edges, respectively,

Rc and Re are the radii of the inner surface of the band at the tire equator and the band edges, respectively.